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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/816,909	03/23/2001	Yoh-Han Pao	0655/63835	7514

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EXAMINER	
STARKS, WILBERT L	
ART UNIT	**PAPER NUMBER**
2121	

DATE MAILED: 01/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Supplemental Notice of Allowability	Application No.	Applicant(s)	
	09/816,909	PAO ET AL.	
	Examiner	Art Unit	
	Wilbert L. Starks, Jr.	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *the filing of 17 May 2004*.

2. ☒ The allowed claim(s) is/are *30-49*.

3. ☒ The drawings filed on *18 May 2004* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Paul Tang, Esq. on 17 December 2004.

The application has been amended as follows:

Examiner's Amendments

30. (Previously presented) A system for visualizing multi-dimensional pattern data reduced to a lower dimension representation, comprising:

a neural network having an input layer and an other layer, wherein a number of nodes in the other layer is less than a number of input nodes in the input layer, and the other layer supplies an output signal corresponding to multi-dimensional pattern data received by the input layer; and

a training module for the neural network, wherein the training module includes means for equalizing and orthogonalizing the output signal of the other layer.

31. (Amended) The system of claim [1] 30, wherein the training module equalizes

and orthogonalizes the output signal of the other layer by constraining values of a covariance matrix of the output signal.

32. (Amended) The system of claim [1] 30, wherein the training module equalizes and orthogonalizes the output signal of the other layer by reducing a covariance matrix of the output signal to a form of a diagonal matrix.

33. (Amended) The system of claim [1] 30, wherein output data is collected from the neural network, and a two-dimensional map of the output data is displayed.

34. (Amended) The system of claim [1] 30, wherein output data is collected from the neural network, and a plurality of two-dimensional maps of the output data are displayed.

35. (Amended) The system of claim [1] 30, wherein the lower-dimension representation is a three dimensional display.

36. (Amended) The system of claim [1] 30, wherein the training module performs self-supervised training.

37. (Amended) The system of claim [1] 30, wherein the neural network is self organizing.

38. (Amended) The system of claim [1] 30, wherein nodes in the other layer are non-linear.

39. (Amended) The system of claim [1] 30, wherein the other layer comprises an output layer.

40. (Previously presented) A method for visualizing multi-dimensional pattern data reduced to a lower dimension representation, comprising:

providing a neural network having an input layer and an other layer, wherein a number of nodes in the other layer is less than a number of input nodes in the input layer, and the other layer supplies an output signal corresponding to multi-dimensional pattern data received by the input layer; and

training the neural network to equalize and orthogonalize the output signal of the other layer.

41. (Amended) The method of claim [11] 40, wherein the output signal of the other layer is equalized and orthogonalized by constraining values of a covariance matrix of the output signal.

42. (Amended) The method of claim [11] 40, wherein the output signal of the other layer is equalized and orthogonalized by reducing a covariance matrix of the output signal to a form of a diagonal matrix.

43. (Amended) The method of claim [11] 40 further comprising collecting output data from the neural network, and displaying a two-dimensional map of the output data.

44. (Amended) The method of claim [11] 40 further comprising collecting output data from the neural network, and displaying a plurality of two-dimensional maps of the output data.

45. (Amended) The method of claim [11] 40, wherein the lower-dimension representation is a three dimensional display.

46. (Amended) The method of claim [11] 40, wherein the training is self supervised training.

47. (Previously presented) A computer system, comprising:

a processor; and

a program storage device readable by the computer system, tangibly embodying a program of instructions executable by the processor to perform the method claimed in claim 40.

48. (Previously presented) A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to perform the method claimed in claim 40.

49. (Previously presented) A computer data signal transmitted in one or more segments in a transmission medium which embodies instructions executable by a computer to perform the method claimed in claim 40.

Supplemental Allowance

2. Claims 30-49 are allowed.

3. The following is an Examiner's statement of reasons for allowance:

4. The cited prior art taken alone or in combination fails to teach the claimed invention of self-organization of multidimensional data, as claimed by Applicant. Specifically, independent claims 30 and 40 disclose a training module containing means of equalizing and orthogonalizing the output signal of a neural layer.

5. The closest prior art of Pao et al (U.S. Patent Number 6,134,537; dated 17 OCT 2000; class 706; subclass 16) teaches a training module containing means of equalizing and orthogonalizing the output signal of a neural layer, but Applicant has filed a terminal disclaimer regarding that application. To the extent that the features cited above are not in any of the prior art cited by Examiner, the present case is held over the prior art of record.

6. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

7. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Wilbert L. Starks, Jr. whose telephone number is (703) 305-0027.

Alternatively, inquiries may be directed to the following:

S. P. E. Anthony Knight	**(703) 308-3179**
After-final (FAX)	**(703) 746-7238**
Official (FAX)	**(703) 746-7239**
Non-Official/Draft (FAX)	**(703) 746-7240**

WLS

20 December 2004

Wilbert L. Starks, Jr.
Primary Examiner
Art Unit - 2121